

MICHIGAN DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT

INTEROFFICE COMMUNICATION

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Superfund Section, Remediation Division

FROM: Charles Graff, Geologist, Geological Support Unit,  
Superfund Section, Remediation Division

DATE: January 13, 2011

SUBJECT: Comments on "Groundwater Delineation Study--Report, NBIA OU1 PRP Group,  
North Bronson Industrial Area Operable Unit 1, Bronson, Michigan," by O'Brien  
and Gere Engineers, Inc., dated August 13, 2010, Branch County Michigan

**Introduction**

Review of the Groundwater Delineation Study--Report for the North Bronson Industrial Area (NBIA) site is completed. This document prepared by O'Brien and Gere Engineers, Inc. (O&G), for the United States Environmental Protection Agency (U.S. EPA), and the NBIA PRP Group was received August 16, 2010.

This is the second report for the Groundwater Delineation Study. Fieldwork was performed in 2008 and 2010. A total of 13 borings were installed and vertical aquifer sampling (VAS) was performed in these borings. Subsequently, 13 monitoring wells were installed based on the aquifer data from the borings, some of which were paired well clusters.

My comments follow.

**Summary of Comments**

Overall, it appears that the groundwater plume west, northwest and north of the Western Lagoon Area has been delineated. However, the migration of contamination along the northern side of County Drain #30 has not been fully determined. It appears from the text that it is assumed that the groundwater contamination eventually migrates into the drain. The full extent of the contamination must be determined to most accurately place the groundwater ordinance on the respective properties.

This report contains no conclusions or recommendation sections.

O&G places significant emphasis on the difference between the 2008 and 2010 delineation fieldwork. These two field sessions were both part of the groundwater delineation work, so although the work was split up into two phases, the results make up one study. The resulting text and effort to separate the phases of this fieldwork is confusing.

It would be most helpful to see the vertical aquifer sampling data placed onto a figure next to the boring locations. Doing this will supplement the monitoring well data figures and provide the reader with a more complete understanding of contamination present within the aquifer. Similarly, Figure 7, "Extent of Chlorinated VOCs in Ground Water," should document the actual

volatile organic compound (VOC) values instead of coding each location with a color that indicates a range of VOC concentrations.

There is no mention of disposal of the many drums that were staged in the Western Lagoon Area. A number of these drums contained waste water, which will freeze during the winter and destroy the integrity of the drums, which will allow the water to drain away as it melts. O&G needs to account for these drums in this report, especially those filled with water. At least the water-filled drums should be removed this winter if they are not gone already.

The Monthly Progress Report for December 2010 was just received and it indicates that development and decontamination water was recently disposed of off site. If this work addressed these water-filled drums, a clarification would be appreciated.

### **Specific Comments**

Page 2, Section 1.2 Purpose and Objectives. The last line of this paragraph states that the data from this report will "...serve as a basis for developing plans...and for identifying properties in Bronson Township for which environmental restrictive covenants [are or] may be needed to minimize potential exposure to impacted groundwater." It is commonly understood that some properties are contaminated in the township, so the text should be clear about this issue by adding the necessary text inserted above (within the brackets).

Page 4, Section 2.1 Soil Boring Drilling Program, top paragraph. The description provided in the text does not appropriately describe the procedure used for VAS in the field with the Geoprobe. The text is mixing two methodologies together. Geoprobe makes slotted screens (mill-slotted screen two-feet long) and wire-wrapped screens; the one described is ~4-feet long. This latter screen is referred to as an SP-16 and is ~40-inches long. This paragraph should be rewritten to clarify the method actually used.

Page 5, Section 2.1.3 Monitoring Well Development, second paragraph. O&G needs to identify where they got the listed stabilization parameter values, since they do not correlate to any values in any U.S. EPA protocol for development or sampling used by the Department of Natural Resources and Environment (DNRE).

Page 6, Section 2.1.5 Groundwater Sampling and Analysis, second paragraph. Many monitoring wells were purged and sampled at quite low flow rates: many at 100 ml/minute. O&G must explain why purge and sample rates were so low for this aquifer, which for the most part yields water abundantly.

Page 8, Section 2.7 Surveying. I have consulted with people in the surveying field and it is understood that the best top of casing accuracy with survey grade Global Positioning System (GPS) instruments is >1 cm, or ~0.05 feet (about 3/4 of an inch). However, the industry standard for top of casing measurements is 0.01 feet, and the experts I spoke to indicate that achieving 0.01 feet is not possible with any GPS equipment. Too many assumptions must be made that negatively impact accuracy, and too little vertical control is available to yield the required results.

Since the water table at the NBIA is quite flat, it is imperative that the survey of top of casing elevations be as accurate as possible to avoid misinterpretations of groundwater flow directions. The northing and easting measurements should be fine, but the top of casing elevations should be redone with traditional optical survey equipment to provide the necessary vertical accuracy.

O&G needs to indicate specifically which state plane coordinate system they used for the survey, e.g., NAD27, NAD83, etc., and which zone as well.

Page 9, Section 3.1 Geology. As noted above, O&G should discuss the results of both phases of this groundwater delineation study as one and not discuss the results of the two phases separately. It is not apparent in the discussions in this section whether the data from both phases is being considered; sometimes it is clear, and other times not. It would be best to simply describe the general information derived from both phases of work, i.e., the geologic features determined through the fieldwork.

Section 3.2, Groundwater. An item that O&G must discuss is that in each of the water level elevation maps, MW-43 always has a higher water elevation than the monitoring wells that surround it. The elevation of this monitoring well is an outlier that needs to be explained. The contouring ignores this high point by placing contour lines of lower hydraulic head upgradient of this monitoring well, which is not appropriate unless this point is being ignored. These issues must be discussed in this report.

Page 11, Section 3.6.2 Metals in Groundwater. It is acceptable to make observations on the two rounds of chemical data collected, particularly as it relates to plume delineation; however, it is not appropriate to make any significant decisions based on these data. Typically, monitoring wells should be sampled for at least eight quarters before any meaningful decisions can be made about the chemistry from these monitoring wells.

## Figures

Figure 3, the cross sections, indicates that MW-42 is screened mostly into a clay unit. There is sand above and below this unit where the screen is positioned. O&G needs to explain why this monitoring well is screened in this fashion.

## Appendices

Appendix C, Groundwater Sampling Logs. O&G needs to explain why they purged and sampled these monitoring wells at such low flow rates: most at the lowest allowed low-flow rate of 100 ml/minute.

Appendix E, Well Development Logs. Two of the five monitoring wells were purged dry during development. For future reference, no monitoring wells should be purged dry during development, or during sampling either for that matter. Purging monitoring wells dry entrains air into the formation, which serves to decrease permeability and changes the geochemistry of the formation surrounding the well screen, which in turn can precipitate minerals from solution, further decreasing permeability on a permanent basis. Subsequent rounds of sampling will determine if these monitoring wells have been compromised by examining key parameters during each sampling event. If these wells have been compromised, further redevelopment may be in order.

It appears from these development logs that the surge block was used sparingly during development; the wording on the logs states "Surged with surge block *periodically* during development." Again, for future reference, the surge block is the main tool for development and should be the primary tool used during development, not the pump.

This concludes my review of this document. If you have any other concerns or questions, please contact me.

cc: John Bradley, DNRE

Daria Devantier

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Charles W. Graff